

This rejection is respectfully traversed.

Firstly, attention to the disclosure of Nishimiya, where the benzoic acid is merely shown as a component of a positive-type photoresist composition (see col. 54, lines 1 et seq.).

In contrast, the present invention is directed to a negative-type photosensitive resin composition, which is a material very different from positive-type photoresist compositions.

Specifically, a positive-type photoresist composition produces positive images through the following mechanism: when exposed to light, the composition undergoes chemical reaction such as photolysis, whereby portions that have been exposed to light are dissolved and removed during a development step, forming positive images. In contrast, a negative-type photosensitive resin composition, when exposed to light, undergoes chemical reaction such as photopolymerization or photo-crosslinking, whereby non-exposed portions are resolved and removed during development to thereby form negative images. Thus, positive-type photosensitive compositions and negative-type photosensitive compositions function on a completely different mechanism and provide opposite results.

Thus, concerning positive-type photoresist compositions, "improvement in sensitivity" generally means acceleration of photolysis when exposed to light, or enhancement of dissolution rate at exposed portions during the development step. In contrast, when negative-type photosensitive resin compositions are concerned, "improvement in sensitivity" generally means acceleration of photopolymerization rate or photo-crosslinking rate, or enhancement of dissolution rate at non-exposed portions during the development step.

Thus, whether or not a material that functions as an agent for improving sensitivity of positive-type photoresist compositions can also function as much for negative-type photosensitive resin compositions is completely unknown. Even those skilled in the art would not be motivated to use a material that is known to improve sensitivity of positive-type photoresist compositions for purposes of improving sensitivity of negative-type photosensitive compositions.

More importantly, in the present invention, component (E) is used in order to attain the object of increasing the depth of non-printing areas (i.e., non-printing depths), or in other words, so as to improve resolving properties.

Since sensitivity and resolution are independent evaluation items, a material that functions to improve sensitivity cannot be said to also improve resolution. Therefore, is it quite unlikely that skilled artisans who are aware of compositions disclosed by Kashio would think of incorporation of benzoic acid - which is a sensitivity improving agent listed in Nishimiya - for the purpose of improving resolution.

In sum, the present invention is not obvious from the combination of Kashio and Nishimiya.

Claims 1-4 are rejected under 35 USC §103(a) as being unpatentable over Pine (US 4,361,640) in view of Nishimiya et al. (US 6,030,748).

This rejection is also respectfully traversed.

The rejection holds that the present invention is obvious from Pine in view of Nishimiya, on the grounds that Pine teaches components (A) - (D) of the present invention and Nishimiya teaches incorporation of benzoic acid in order to increase sensitivity of the composition, the benzoic acid corresponding to component (E) of the present invention, and that therefore incorporation of benzoic acid disclosed by Nishimiya into a composition disclosed by Pine is obvious for persons skilled in the art.

However, as stated above, use of a material not known to serve as an agent for improving sensitivity of a positive-type photoresist composition for the purpose of improving sensitivity of negative-type photosensitive resin compositions would hardly occur to persons skilled in the art. Moreover, a material that is capable of increasing sensitivity is not always capable of increasing resolution. Thus, skilled artisans who are aware of compositions disclosed by Pine are unlikely to think of use of benzoic acid, which is a sensitivity improving agent listed Nishimiya.


In sum, the present invention is not obvious from the combination of Pine and Nishimiya.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

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